

Fig. 5.

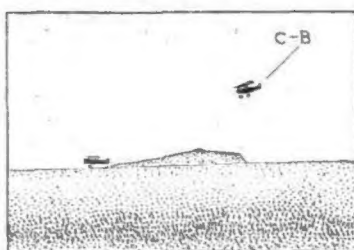


Fig. 6.

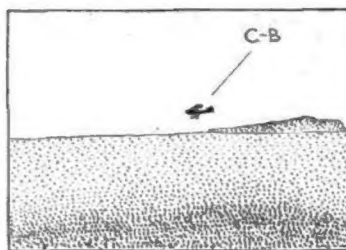


Fig. 7.

Landing approach of the Crouch-Bolas biplane and a conventional biplane. The sketches are accurate copies of an actual film.

conventional machine still behind it and below it lessening the distance between the two aeroplanes.

Fig. 6 shows the Crouch-Bolas type gliding in with its engines revving at slow

speed, so that in the remote event of engine failure the fact that the aeroplane is flying at less than its stalling angle without engines constitutes no increased hazard whatsoever on this score.

The conventional machine, however, with its normal landing speed has been forced to overtake the Crouch-Bolas machine, and is seen in the photograph well in advance of its competitor and already on the ground, commencing its landing run.

Fig. 7 shows the Crouch-Bolas in the process of dropping its tail preparatory to making a low-speed landing, this manoeuvre normally being carried out either when in close proximity to the ground or at the time of contact, in order to avoid any possible danger which might arise from the unlikely failure of an engine.

The subsequent landing occupies but a short space, ten to fifteen yards being the average sort of figure.

The position of the Crouch-Bolas when landing is shown in Fig. 8; its attitude can be judged from the position of the tail wheel.

As a result of tests and calculations it is claimed for the Crouch-Bolas scheme that it will:

1. Decrease the time and distance for take-off by 50 per cent.
2. Increase angle of climb while retaining the same rate of climb, by nearly 100 per cent.
3. Increase the speed range by approximately 75 per cent.
4. Decrease the sinking speed, as distinct from forward speed, to approximately 50 per cent. of that obtained on modern aircraft fitted with wing flaps.
5. Decrease the landing speed and distance run by about 50 per cent.

These characteristics, it is claimed, are achieved without sacrifice of maximum speed, load-carrying capacity or safety characteristics. Control and manoeuvrability are retained down to and beyond the stalling speed.

Capt. Goodman-Crouch, who has been back from America for some time, is now in touch with several British aircraft firms, and it may be expected that the Crouch-Bolas scheme will be applied to British machines in the not too-distant future. In the meantime Mr. Harold Bolas is watching the American end of the partnership, and there may soon be developments to report from the other side.

### France Builds an Asboth Helicopter

UNDER the title of "Société des Hélicoptères Asboth," a company has recently been formed in France to acquire the licence for the Asboth helicopter. A machine with a 180 h.p. engine is stated to be nearing completion.

Several years ago, in Hungary, Mr. von Asboth built four experimental helicopters, and flights said to have totalled a duration of 30 hours were made. Air Ministry officials, including the late A.V.-M. Sir Sefton Brancker, saw a demonstration in Budapest in 1930.

One projected design was discussed in some detail in *Flight* three years ago. The English company is Asboth Helicopters, Ltd., Cliffords Inn, London, E.C.4.

### "Aerolite" Synthetic Glue on the Market

MANY readers will recall the outstanding paper on plastics in aircraft construction, read by Dr. N. A. de Bruyne before the R.Ae.S. in January, 1937. References in that lecture to an obviously remarkable synthetic glue called "Aerolite" will also be remembered.

Dr. de Bruyne's organisation, Aero Research, Ltd., Duxford, Cambs, are now marketing "Aerolite," and its properties are described in detail in a booklet recently issued.

Among the claims made are that when a joint made with "Aerolite" glue is tested to destruction it will always show a wood failure; that the glue is truly waterproof, and remains completely efficient even after 18 months' immersion; and that it is simple and economical to use.

"Aerolite," the first glue of its kind to be approved by the Air Ministry, is released by the approved system of inspection of Aero Research, Ltd.

cient to offset the very small loss in airscrew efficiency at cruising speed which results from tilting the airscrew axis.

As the increase in lift results from accelerating the air which passes across the wing, it follows fundamentally that it can be superimposed upon and added to the extra lift obtained from such devices as slots and flaps. Calculations based upon research and experiments indicate that an aircraft with the usual modern high-lift devices and tilted airscrews whose swept area covers the greater part of the wing can be expected to give a maximum lift coefficient of 5.0 (or 2.5 in the old "absolute" units). This may seem staggering, until one remembers that in calculating "backwards," so to speak, one takes into account wing loading and forward speed of aircraft (which is low), but not slipstream speed across the wing. In actual figures it means, using the old fundamental formula,  $L = W = C_L \rho A V^2$ , that for a wing loading of 50 lb./sq. ft. the minimum speed would be about 63 m.p.h.!

That all this is not mere theorising seems to emerge from the flying tests carried out in America with the experimental biplane some time ago. Climbing and gliding angle rather than landing speed were the objects aimed at, and we have pictures from a film taken at the time which shows the take-off and landing of two machines, one the Crouch-Bolas experimental biplane and the other a normal standard American biplane. Both machines had a wing loading of 10.5 lb./sq. ft., and the conventional biplane had considerably more power

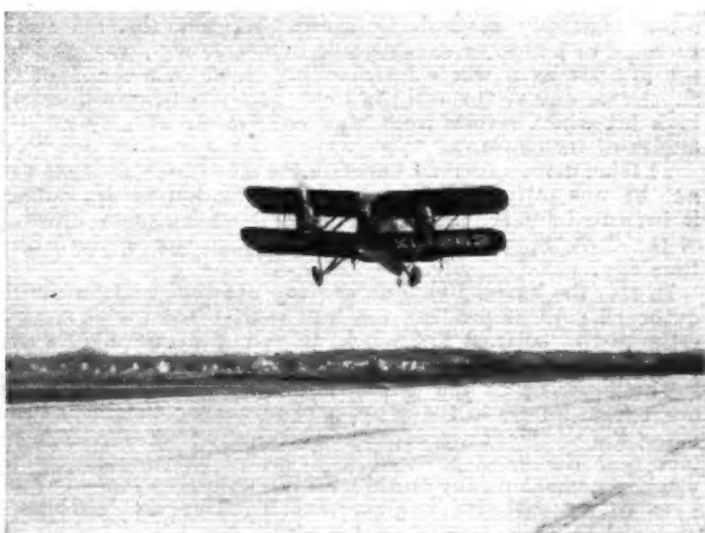


Fig. 8. The Crouch-Bolas biplane in a typical landing attitude.

than the C.-B. Unfortunately, the film pictures are too small and too indistinct for reproduction, but we have had prepared from them the small sketches, which represent quite accurately what the film shows.

Fig. 1 shows the machines taking off together. Four seconds later the Crouch-Bolas machine had left the ground, and Fig. 2 shows it already in the air while the conventionally designed machine is still on the ground.

At a safe height, i.e., when it is permissible to place the machine in what normally would be a stalled attitude, the nose is elevated and the machine is climbed at low forward speed but at the same rate of climb, thus increasing the angle of climb far beyond the normal.

Fig. 3 shows the two aeroplanes in their respective positions at this point, while Fig. 4 gives an indication of the distance travelled by both aeroplanes in order to reach the test height.

In the case of landing the increased angle of descent and the low forward speed and decreased sinking velocity are clearly demonstrated.

Fig. 5 shows the Crouch-Bolas type descending at a steep angle, low forward speed, and low sinking velocity, with the